

Frank GRANA
06-8-3

Source Test Report For:

**HEXAVALENT AND TOTAL CHROMIUM
EMISSIONS FROM CHROME PLATING
TANK NO. 19B AT
CALIFORNIA ELECTROPLATING, INC.
USING FUMETROL 140, DIS-MIST NP,
AND POLYBALLS**

Conducted At:

**CALIFORNIA ELECTROPLATING, INC.
3510 East Pico Street
Los Angeles, CA 90023**

For Submittal To:

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 East Copley Drive
Diamond Bar, CA 91765**

Submitted On:

November 24, 2004

Prepared By:

**PROFESSIONAL ENVIRONMENTAL SERVICES, INC.
5027 Irwindale Avenue, Suite 100
Irwindale, CA 91706**

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FUMETROL 140, DIS-MIST NP, AND POLYBALLS**

GENERAL INFORMATION

Source Owner:	California Electroplating, Inc. 3510 East Pico Street Los Angeles, CA 90023
Contact:	Mr. Frank Grana Telephone: 323-268-7233 Fax: 323-269-0554
Source Description:	Decorative Chrome Tank 19B
SCAQMD Facility ID No.	09120 Permit to Operate R-M24935
Agency:	South Coast Air Quality Management District 21865 East Copley Drive Diamond Bar, California 91765-4182
Environmental Consultant:	Mr. M. Dean High 78624 Cimmaron Canyon Palm Desert, CA 92211 Telephone: 760-200-1275 Fax: 760-200-8835
Source Test Contractor:	Professional Environmental Services, Inc. 5027 Irwindale Avenue, Suite 100 Irwindale, California 91706
Contact:	Mr. Dennis Becvar Telephone: 626-962-3278 Fax: 626-962-5905 Email: dbecvar@mpowercom.net

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1.0 INTRODUCTION AND PROCESS DESCRIPTION

On October 23, 2004 Professional Environmental Services, Inc., Irwindale, California, conducted source emissions testing to determine the effectiveness in reducing hexavalent chromium emissions on a decorative chrome electroplating tank using a combination of mist suppressant, foam and polyballs at California Electroplating, Inc., 3510 East Pico Street, Los Angeles, California. SCAQMD Rule 1469, (c)(8)(A), amended May 2, 2003, requires chromium electroplating facilities to limit their hexavalent chromium emissions to 0.0015 milligrams per ampere-hour or less. The purpose of this testing program was to determine if the hexavalent chromium emissions at California Electroplating would be in compliance with SCAQMD Rule 1469 while using a combination of air pollution control techniques.

California Electroplating performs decorative chrome electroplating of nuts, washers, and other pieces of hardware in Tank 19B, a decorative chrome plating tank (36"W x 72"L x 48"H). The material plated in the tank during the source testing included eight flat pieces of metal measuring 5" wide and 36" long (the surface area on each side is 1440 square inches, or a total surface area plated of 2,880). The concentration of chromic acid in the tank was determined before and after testing to be 30.2 ounces per gallon. The surface tension of the liquid was measured with both a stalagmometer and a tensiometer on samples collected before and after the testing. The surface tension was determined to be 29 dynes per centimeter and 22 dynes per centimeter for stalagmometer and tensiometer respectively. The solution temperature was maintained at 105 degrees Fahrenheit. The entire surface of the tank was covered with polyballs one inch in diameter and a foam thickness of approximately 1.25 inches during tank operation. The mist suppressant was Fumetrol 140 and the foam was Dis-Mist NP.

2.0 TESTING METHODOLOGY

Tank 19B was not connected to air pollution control equipment; therefore, it was necessary to install a temporary ventilation hood over the tank. The temporary hood included an

exhaust fan that was used to pull the ambient air from the shop into the hood and over the surface of the liquid in the tank and to provide a temporary stack to facilitate emissions testing. The emissions testing was conducted following the procedures of EPA Reference Method 306 "Determination of Total and Hexavalent Chromium Emissions from Stationary Sources, Isokinetic Method". A total of three test runs, each 168 minutes in duration, were conducted.

This testing program was based on similar tests previously conducted by the SCAQMD. The two SCAQMD documents that served as references for this work are: "Measurement of Hexavalent Chromium Emissions from Chromium Plating and Chromic Acid Anodizing Operations for Certification of Wetting Agent Chemical Fume Suppressant Subject to SCAQMD Rule 1469", dated: August 14, 2003, a technical guidance document; and, "Hexavalent and Total Chromium Emissions from a Decorative Chrome Plating Tank Controlled by Various Mist Suppressants," dated: March 26, 2004, a series of source tests conducted by the SCAQMD.

The design, installation and operation of the temporary hood followed the guidelines as currently published by ACGIH in "Industrial Ventilation, A Manual of Recommended Practice", 23rd Edition. A diagram showing the installation of the hood over the tank is shown in **Figure 1**.

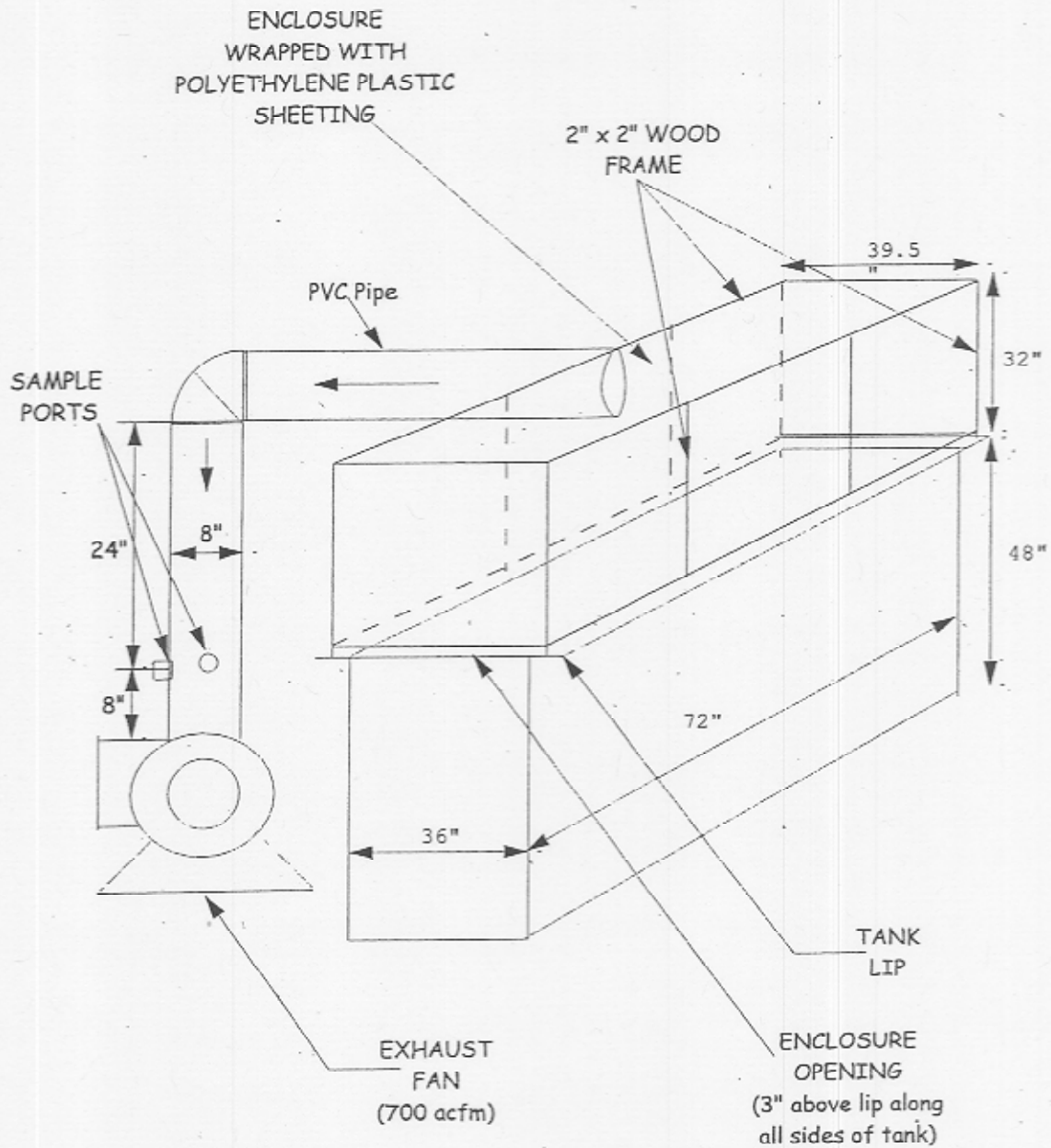
In order to assure that the face velocity along the perimeter of the opening in the hood did not drop below 50 fpm a fan rated at approximately 700 acfm was used.

Several photographs of the tank and temporary hood are located in the Appendices to this report. During the testing the rectifier was turned on and off to simulate normal plating operations. The rectifier was set at 3 VDC and 600 amperes and was operated intermittently to simulate normal plating operations (on for approximately five minutes, and turned off for approximately five minutes). This testing program was based on EPA and SCAQMD published source test methods that included the following:

2.1 Sample and Velocity Traverse (SCAQMD Method 1.1)

The procedures specified by SCAQMD Method 1.1, "Sample and Velocity Traverses for Stationary Sources", were followed for the determination of the number and location of traverse points used for the velocity traverses. The number of straight run stack diameters (eight inch diameter duct) upstream and downstream from the sample ports was three. A total of twelve traverse points were sampled through each two sampling ports for a total of twenty four traverse points. The location of the sampling ports for the tank is shown in **Figure 1**.

Figure 1
Diagram of Temporary Hood on Tank 19B
California Electroplating, Inc.



Scale: No Scale

2.2 Stack Gas Flow Rate (SCAQMD Method 2.1)

The procedures specified by SCAQMD Method 2.1, "Determination of Stack Gas Velocity and Volumetric Flow Rate (Type-S Pitot tube)," were followed to determine the stack gas velocity and volumetric flow rate. A Type-S Pitot tube and K-Type thermocouple were positioned at each traverse point and the Pitot tube differential pressure and exhaust gas temperature data were recorded on field data sheets. The Pitot tube was connected to a Dwyer inclined oil manometer and the thermocouple was connected to an Omega, Model 601 digital temperature readout. The Pitot tube, thermocouple and readout devices were calibrated in accordance with SCAQMD and US EPA requirements prior to use in the field. A cyclonic flow check was conducted prior to sampling. Since there were no sources of combustion gases in the exhaust stream the molecular weight was assumed to be ambient air and was calculated in accordance with SCAQMD Method 3.1.

2.3 Hexavalent and Total Chromium (EPA Method 306)

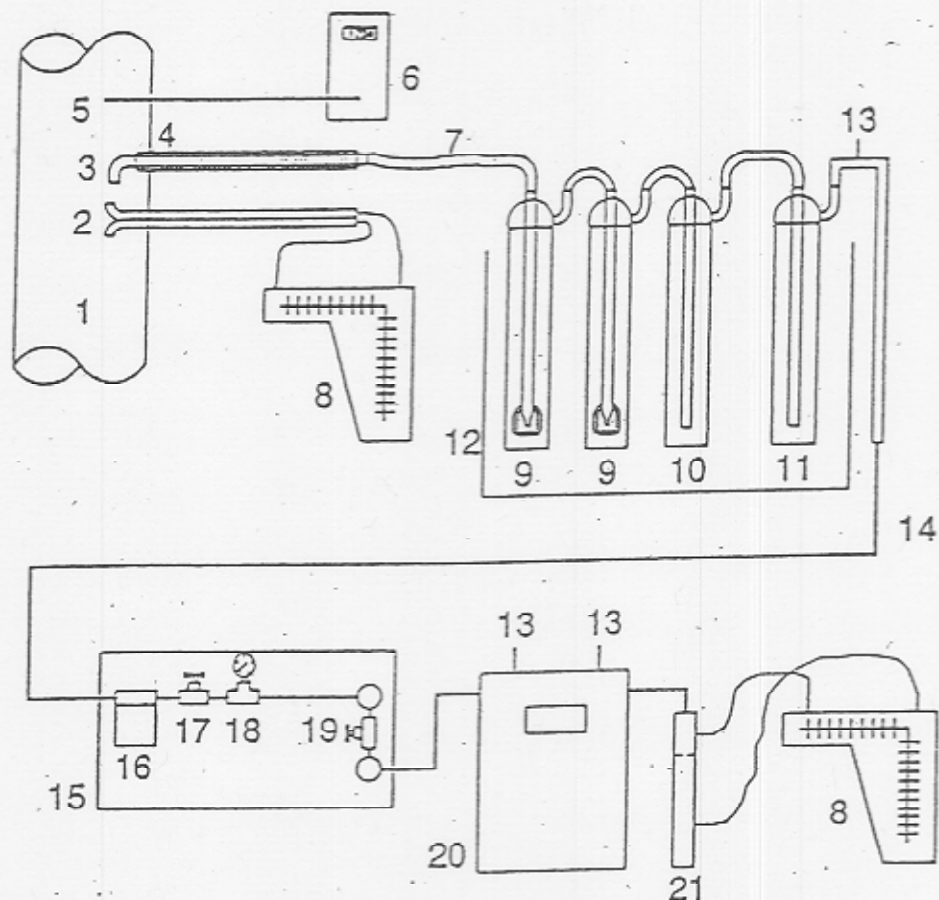
The sampling trains, configured in accordance with EPA Method 306, "Determination of Hexavalent and Total Chromium Emissions from Stationary Sources," were used for the emissions testing. The exhaust gas was sampled for a period of 168 minutes per test run using isokinetic sampling techniques. A diagram of the wet impingement sampling train used for EPA Method 306 is shown in **Figure 2**.

Each sampling train was configured with a glass nozzle, connected to a glass probe that was connected by a flexible Teflon line to four impingers connected in series. The first and second impingers each contained a solution of 0.1N sodium bicarbonate, the third impinger was empty and the fourth impinger contained approximately 400 grams of indicating silica gel. The moisture content of the stack gas was determined from the condensate collected in the sampling trains. The weight gain of each impinger and the weight of the silica gel were recorded before and after the test in order to obtain the moisture gain for the sample. All sample volumes, solution pH, and weights were recorded immediately on sample recovery sheets during charging and sample recovery.

After the test, the contents of the probe wash and impingers were placed in a 500-ml polyethylene container. The sampling train was rinsed three times from the nozzle to the third

Figure 2

EPA Method 306 Sampling Train for Hexavalent and Total Chromium



- | | |
|---|--|
| 1. Stack | 11. Modified G/S impinger charged w/silica gel |
| 2. Pitot tube | 12. Ice bath |
| 3. Glass or quartz nozzle | 13. Thermocouple |
| 4. SS probe w/glass liner | 14. Umbilical line |
| 5. Thermocouple | 15. Sealed vacuum pump |
| 6. Digital Potentiometer | 16. Pump filter |
| 7. 1/2" Teflon tubing | 17. Shut-off valve |
| 8. Inclined oil manometer | 18. Vacuum gage |
| 9. Greenberg/Smith impinger charged w/0.1N NaHCO ₃ | 19. Bypass metering valve |
| 10. Modified G/S impinger empty | 20. Dry gas meter |
| | 21. Orifice flow indicator |

impinger with 0.1N sodium bicarbonate. The impinger solutions were chilled to 68°F or less during and after the tests.

The recovered samples and blanks were delivered to West Coast Analytical Services, Inc., Santa Fe Springs, California for analyses. The analyses of the samples was conducted in accordance with CARB Method 425. This method allows for additional laboratory quality control resulting in lower levels of detection when compared to EPA Method 306.

2.4 Field Testing Quality Assurance

Prior to field sampling, the dry gas meter and orifice were calibrated against a NIST traceable reference test meter. The results of the orifice calibration are expressed as the delta H@ at various pressure drops (in inches of water) to achieve 0.75 cfm sampling rate at standard conditions as specified in EPA Publication APTD-0576. The dry gas meter accuracy is expressed as gamma (Y) and is determined as the ratio between the reference meter and the meter box dry gas meter. All temperatures were monitored with type-K thermocouples connected to an Omega 601 digital readout. The thermocouples used were calibrated at various temperatures against a NIST traceable mercury-in-glass thermometer. The calibration criteria for the EPA Method 306 sampling equipment are summarized in Table 1.

The Pitot tube used to measure stack velocity was constructed following the dimensions specified in SCAQMD Method 2.1. A Pitot tube correction factor of 0.84 was assigned for determining volumetric flow through the exhaust gas stack since all construction specifications were expected to meet quality control criteria.

At the conclusion of each test run the sampling train was leak checked at a vacuum equal to or greater than the highest vacuum observed during the test runs. The sampling train was considered leak free if the leak rate was less than 0.02 cfm.

At the beginning of the field testing program samples of the 0.1 N sodium bicarbonate solution used for sample train preparation and recovery were obtained and identified as reagent blanks. The laboratory performed spike recovery and duplicate analysis on one of the samples submitted for analysis.

TABLE 1
Calibration Procedures and Criteria For
EPA Method 306 Sampling Equipment

Parameter	Calibration Technique	Reference Standard	Acceptance Limit	Frequency
SCAQMD Method 306 Measurements				
1. Probe nozzle	Measure Diameter to nearest 0.001"	Micrometer	Average of three measurements; difference between high and low <0.1 mm	Prior to test
2. Gas Meter Volume	Compare to Reference Meter	Dry Gas Meter Transfer Standard	Record calibration factor $\pm 5\%$ of pretest calibration factor	Prior to test
3. Gas Meter Temperature	Compare to Mercury-in-glass	ASTM Thermometer	± 5 deg F	Posttest
4. Stack Temperature Sensor	Heated block monitored with potentiometric thermocouple system	NIST Traceable potentiometric thermocouple system	$\pm 1.5\%$ of minimum absolute stack temperature	Prior to test
5. Final Impinger Temperature Sensor	Compare to Mercury-in-glass	ASTM thermometer	± 5 deg F	Prior to test and Posttest
6. Aneroid Barometer	Compare to Mercury Barometer	Mercury column barometer	± 2.5 mm	Prior to test and Posttest
7. S-Type Pitot Tube		Micrometer and Angle finder	No change from pretest data	Prior to test and Posttest

2.6 Sample Custody

A specific Chain-of-Custody procedure was used for this project. The elements of this procedure included:

- Sample identification
- Sample labels
- Documentation
- Chain-of-Custody forms

The sequence of activities concerned with sample custody together with identification and tracking procedures were as follows:

- Testing team collected samples using appropriate containers, affixes sample ID labels to sample containers, to master log, and to field data sheet.
- Samples were returned to the PES laboratory accompanied with Chain-of-Custody form.
- Samples were transferred or shipped to subcontract laboratory with Chain-of-Custody form.
- Samples were examined at each transfer point for integrity (seal, breakage, readable labels).

Upon completing the required analysis, the laboratory returned the Chain-of-Custody form along with the results to the PES project manager. All samples were accounted for by the laboratory supervisor and project manager. The laboratory identified the samples in laboratory logbooks by the sample identification number as well as any internal identification. The logbooks and notebooks are maintained and retained in accordance with SCAQMD and US EPA requirements for good laboratory practice.

3.0 RESULTS

The results of this source testing program are presented in **Table 2**. The source test results show hexavalent chrome emissions in the range of 0.0001 to 0.0002 mg/amp-hr when using a combination of mist suppressant, foam and polyballs. These results indicate that California Electroplating, Tank 19B, with a combination of control techniques meets the requirements of Rule 1469 (c)(8)(A). The process data recorded during the test are summarized in **Table 3**. Additional information such as photographs, copies of the field data sheets, laboratory reports, and calibration information are located in the Appendices to this report.

After the hood was installed a smoke test was conducted to verify that the opening at the bottom of the hood just above the lip of the tank was under negative pressure. The smoke test did indicate (photograph of smoke test is located in Appendix A) that the exhaust fan was providing sufficient suction. Also, a hand-held electronic anemometer was used to verify that a face velocity of at least 50 feet per minute was maintained at the hood slot. The actual face velocity was slightly more than 65 feet per minute.

Table 2
Total and Hexavalent Chromium Emissions Data
For Tank #19B
California Electroplating, Inc.
Los Angeles, California

Test Date: October 23, 2004

Run Number	1	2	3	Average
Sample Date	10/23/04	10/23/04	10/23/04	
Sample Time (clock time)	0725-1014	1023-1307	1320-1610	
Stack Temperature (deg F)	71	72	75	
Exhaust Gas Velocity (ft/sec)	35.56	35.69	35.64	
Static Pressure, in. H ₂ O	-0.20	-0.20	-0.20	
Exhaust Flow Rate (acfm)	722	724	723	
Exhaust Flow Rate (dscfm)	708	707	703	
Moisture (% v/v)	1.3	1.4	1.4	
Sample Volume (dscf)	116.915	114.386	114.014	
Sampling Time (minutes)	168	168	168	
Isokinetic Rate (%)	103	101	101	
Current applied (ampere-hours/hour)	411	362	425	
Hexavalent Chromium				
Sample Catch (ug/sample)	0.25	0.09	0.08	0.14
Concentration (mg/m ³)	0.00008	0.00003	0.00003	0.00005
Emission Rate (mg/hr)	0.091	0.033	0.030	0.051
Emission Factor (mg/amp-hr)	0.00022	0.00009	0.00007	0.00013
Total Chromium				
Sample Catch (ug/sample)	0.64	0.42	0.43	0.50
Concentration (mg/m ³)	0.00019	0.00013	0.00013	0.00015
Emission Rate (mg/hr)	0.232	0.156	0.159	0.182
Emission Factor (mg/amp-hr)	0.00057	0.00043	0.00037	0.00046

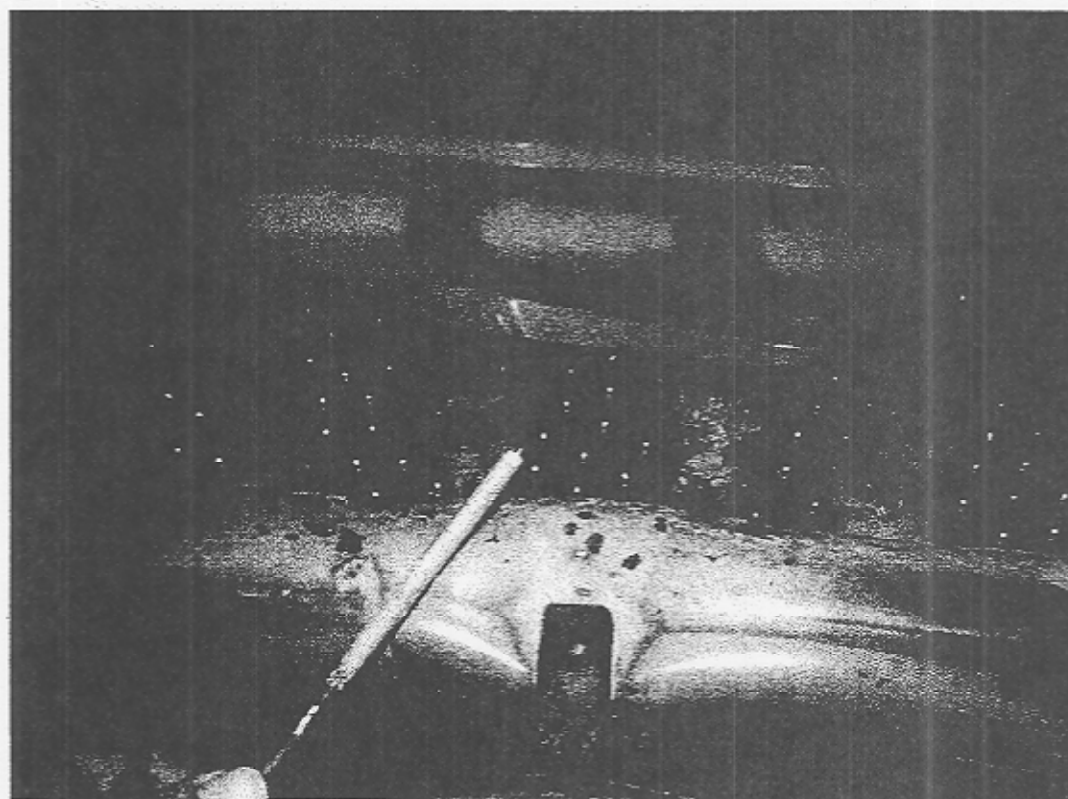
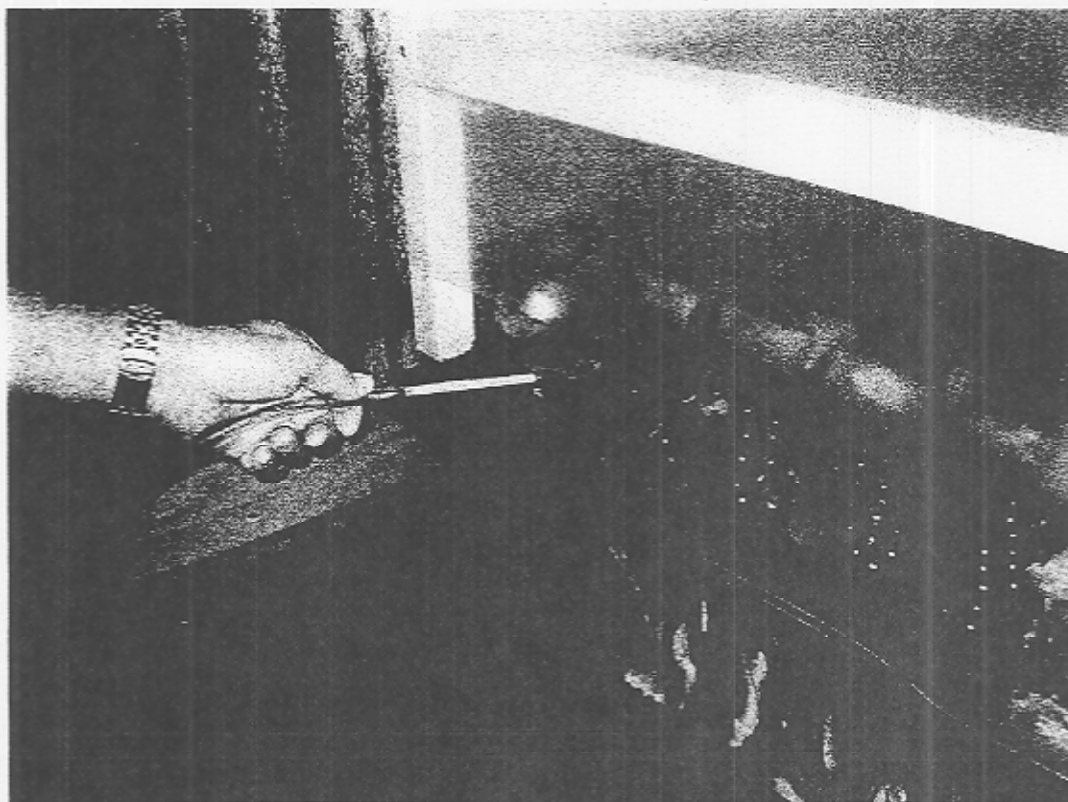
Table 3
Process Data for Tank #19B
California Electroplating, Inc.
Conducted on: October 23, 2004

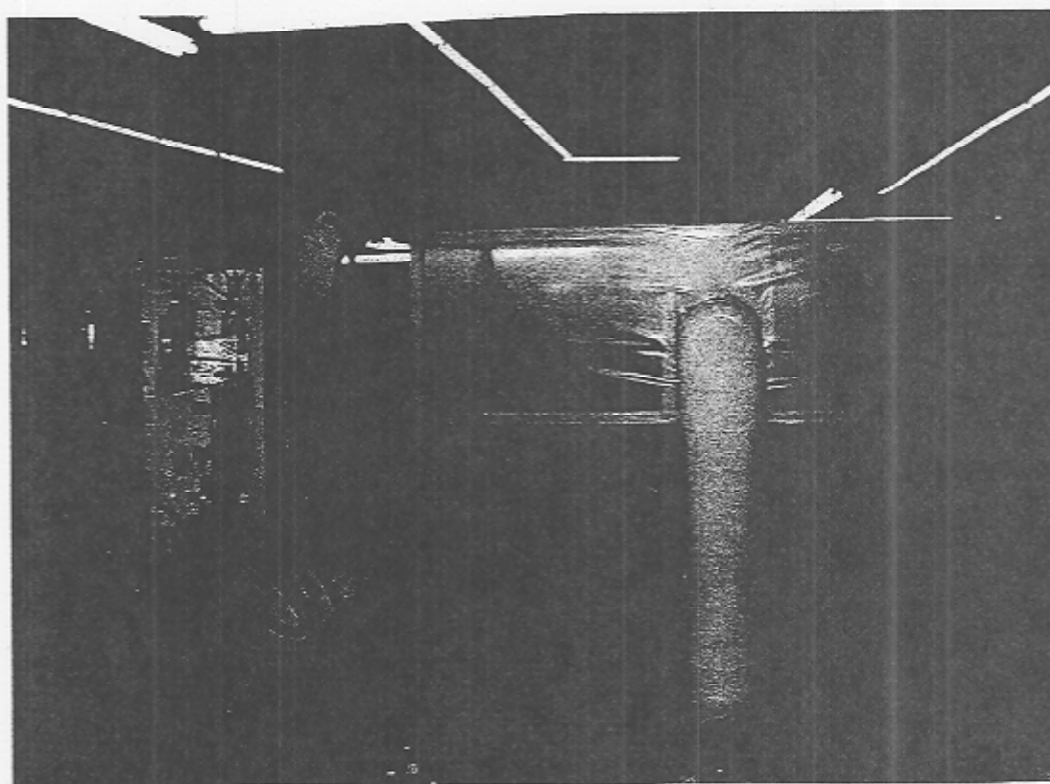
Parameter	Results
Rectifier Data	
Nominal current during test (amps)	600
Maximum rectifier current (amps)	1,000
Voltage during test (VDC)	3
Tank Liquid	
Chromic Acid Concentration	
Before Test Run No. 1 (ozs/gal)	30.2
After Test run No. 3 (ozs/gal)	30.1
Temperature-hot water heated (deg F)	105
Freeboard (inches)	5
Mixing	
Mechanical Mixing	none
Air Sparging	none
Pollution Prevention	
Surface Tension	
Before Test Run No. 1	
Stalagomometer (dynes/cm)	29
Tenisometer (dynes/cm)	22
After Test Run No. 3	
Stalagomometer (dynes/cm)	29
Tensiometer (dynes/cm)	23
Foam Thickness (inches)	1-1.25
Polyballs	
Surface Coverage (per cent of tank surface area)	95%
Dimaeter of polyballs (inches)	1
Material Plated	
Number of parts (each part 5 inches x 36 inches)	8
Total Surface area (includes both sides) (sq.ft.)	20
Approximate Current Density (amps/sq ft) ¹	30

¹ Based on 600 amperes when rectifier was turned on (600 amperes/20 sq. ft.)

APPENDIX A

**PHOTOGRAPHS OF DECORATIVE CHROME PLATING TANK #19B
WITH TEMPORARY HOOD IN PLACE
CALIFORNIA ELECTROPLATING, INC.**





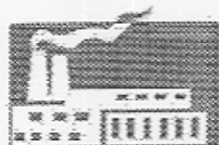
APPENDIX B
FIELD DATA SHEETS

CHROME CALCULATION SHEET

PLANT: California Electroplating
SOURCE: Tank 19B Exhaust
DATE: 10/23/2004
STANDARD TEMP (EPA = 68 DEG.)

68

RUN NUMBER	1	2	3
FIELD DATA INPUTS:			
BAROMETRIC PRESSURE ("Hg)	29.88	29.88	29.88
STACK DIAMETER (in.)	7.88	7.88	7.88
PITOT CORRECTION	0.99	0.99	0.99
SQRT DELTA P ("H ₂ O)	0.534	0.535	0.533
STACK TEMP (°F)	70.5	72.2	74.8
STATIC PRESSURE ("H ₂ O)	-0.20	-0.20	-0.20
VOLUME SAMPLED (cf)	118.152	117.971	118.085
METER TEMPERATURE (°F)	75.6	86.6	88.9
METER GAMMA	1.001	1.001	1.001
DELTA H ("H ₂ O)	1.67	1.67	1.66
LIQUID COLLECTED (mls)	32.9	35.2	34.3
OXYGEN (%)	20.90	20.90	20.90
CARBON DIOXIDE (%)	0.00	0.00	0.00
SAMPLING TIME (min.)	168.0	168.0	168.0
NOZZLE DIAMETER (in.)	0.243	0.243	0.243
PROCESS DATA:			
AMPERE HOURS	411	362	425
LABORATORY DATA:			
HEXAVALENT CHROME (ug)	0.25	0.09	0.08
TOTAL CHROME (ug)	0.64	0.42	0.43
FLOW RESULTS:			
VOLUME SAMPLED, DSCF	116.915	114.386	114.014
VOLUME SAMPLED, DSCM	3.311	3.239	3.229
MOISTURE IN SAMPLE (CF)	1.55	1.66	1.62
MOISTURE (%)	1.31	1.43	1.40
MOLECULAR WEIGHT (DRY)	28.84	28.84	28.84
MOLECULAR WEIGHT (WET)	28.69	28.68	28.68
STACK VELOCITY (FT/SEC)	35.56	35.69	35.64
ACTUAL CFM	722	724	723
STANDARD CFM	717	717	713
DRY STANDARD CFM	708	707	703
THOUSANDS OF DRY STANDARD CFH	42	42	42
CHROME RESULTS:			
ISOKINETIC SAMPLING RATE (100% ±10%)	103.3	101.1	101.4
HEXAVALENT CHROME (mg/DSCM)	0.00008	0.00003	0.00003
HEXAVALENT CHROME (mg/HR)	0.091	0.033	0.030
HEXAVALENT CHROME (mg/AMP HOUR)	0.00022	0.00009	0.00007
TOTAL CHROME (mg/DSCM)	0.00019	0.00013	0.00013
TOTAL CHROME (mg/HR)	0.232	0.156	0.159
TOTAL CHROME (mg/AMP HOUR)	0.00057	0.00043	0.00037



Professional Environmental Services, Inc.

5027 Irwindale Avenue #100
Irwindale, CA 91706
Phone: 626-962-3278 Fax: 626-962-5905

TRAVERSE POINT LOCATION FOR CIRCULAR STACKS

Job Number: _____

Checked by: _____

Plant: California Electroplating

Source: Tank 19B

Date: August 23, 2004

Inside wall to outside nipple (a) No Nipple

Length of nipple (b) 7"

Stack Diameter (a-b): 7.875"

Nearest upstream disturbance: 7 4'φ

Nearest downstream disturbance: 7 1'φ

Calculator: _____



Port Locations & Stack Dimensions

Traverse Point Number	Percent of Stack Diameter	Stack Diameter	Traverse Point Location (without nipple)	Length of Nipple	Traverse Point Location (with nipple)
1	2.1	7.875	0.17	0	0.17
2	6.7	7.875	0.53	0	0.53
3	11.8	7.875	0.93	0	0.93
4	17.7	7.875	1.39	0	1.39
5	25.0	7.875	1.97	0	1.97
6	35.6	7.875	2.80	0	2.80
7	64.4	7.875	5.07	0	5.07
8	75.0	7.875	5.91	0	5.91
9	82.3	7.875	6.48	0	6.48
10	88.2	7.875	6.95	0	6.95
11	93.3	7.875	7.35	0	7.35
12	97.9	7.875	7.71	0	7.71

Dwell Time/Point = (delta P) x (2.75)

Dwell Time/Point = _____ minutes

Job Number: _____

Checked by: _____

 Plant: CAL. ELECTRO
 Source: T19
 Date: 10/23/04
 Operator: DB, JR
 Filter #: N/A
 Imp. Box #: 9B
 Method: A366
 Static Pressure: -0.2 "H₂O
 Run #: 1
 Barometric Pressure: 29.88 "Hg

 Probe length / Type: 2' Glam
 Pitot tube ID: 3/16
 Nozzle ID/diameter: 0.243
 Meter/Pump Box #: 1A
 Meter Delta H@: 1.844
 Meter Gamma: 1.001
 Impinger Pre Leak: 0.009 CFM @ 15 "Hg
 Impinger Post Leak: 0.008 CFM @ 10 "Hg
 Pitot Pre Leak: OK
 Pitot Post Leak: OK

Traverse Point Number	Sampling Time (minutes)	Clock Time (24 hr clock)	Gas Meter Reading (cubic feet)	Velocity Head "H ₂ O	Delta H Actual "H ₂ O	Stack Temp (°F)	Dry Gas Meter Temp Inlet (°F)	Dry Gas Meter Temp Outlet (°F)	Pump Vacuum (in. Hg)	Heated Probe (°F)	Heated Filter (°F)	Silica Gel Imp. (°F)
1	0	0725	576.236	0.30	1.8	67	71	68	4	—	—	55
2	7	0732	581.1	0.27	1.6	67	72	69	4	—	—	56
3	14	0739	586.3	0.27	1.6	67	71	69	4	—	—	56
4	21	0746	591	0.27	1.6	68	71	69	4	—	—	57
5	28	0753	596.3	0.28	1.6	68	71	69	4	—	—	57
6	35	0800	599.1	0.28	1.6	68	72	69	4	—	—	57
7	42	0807	604.2	0.29	1.7	70	72	69	4	—	—	57
8	49	0814	609.3	0.29	1.7	70	73	69	4	—	—	57
9	56	0821	614.7	0.30	1.8	71	75	69	4	—	—	57
10	63	0828	619.0	0.29	1.7	71	75	72	4	—	—	58
11	70	0835	624.5	0.29	1.7	71	77	74	4	—	—	58
12	77	0842	629.4	0.28	1.6	71	77	74	4	—	—	57
1	84	0849	633.3	0.28	1.6	72	78	78	4	—	—	56
1	0	0850	633.3	0.28	1.6	72	78	78	4	—	—	57
2	7	0857	638.1	0.28	1.6	72	79	75	4	—	—	57
3	14	0904	643.2	0.29	1.7	72	79	75	4	—	—	58
4	21	0911	648.4	0.29	1.7	72	80	76	4	—	—	58
5	28	0918	653.2	0.28	1.7	72	81	77	4	—	—	58
6	35	0925	658.1	0.28	1.6	72	80	77	4	—	—	58
7	42	0932	663.0	0.30	1.8	72	80	77	4	—	—	58
8	49	0939	668.5	0.30	1.8	72	82	78	4	—	—	57
9	56	0946	673.1	0.28	1.6	72	83	79	4	—	—	57
10	63	0953	678.3	0.28	1.6	72	85	82	4	—	—	57
11	70	1000	683.1	0.28	1.6	72	85	82	4	—	—	56
12	77	1007	688.6	0.28	1.6	72	86	82	4	—	—	56

Ave / Sum	168	118.152	10.9	1167	70.5	75.6						
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0.534



5027 Irwindale Avenue, Suite 100
Irwindale, California 91706
Phone: 626-962-9375
Fax: 626-962-5905

Job Number: _____

Checked by: _____

Plant: Cal Electro.
Source: T19
Date: 10/23/04
Operator: DB JR
Filter #: N/A
Imp. Box #: 7B
Method: EPA 306
Static Pressure: -0.2 "H₂O
Run #: 2
Barometric Pressure: 29.88 "Hg

Probe length / Type: 2' Glass
Pitot tube ID: ST-18
Nozzle ID/diameter: 0.273
Meter/Pump Box #: 1A
Meter Delta H@: 1.844
Meter Gamma: 1.001
Impinger Pre Leak: 0 CFM @ 16 Hg
Impinger Post Leak: _____ CFM @ _____ "Hg
Pitot Pre Leak: OK
Pitot Post Leak: OK

Traverse Point Number	Sampling Time (minutes)	Clock Time (24 hr clock)	Gas Meter Reading (cubic feet)	Velocity Head "H ₂ O	Delta H Actual "H ₂ O	Stack Temp (°F)	Dry Gas Meter Temp (°F)		Pump Vacuum (in. Hg)	Heated Probe (°F)	Heated Filter (°F)	Silica Gel Imp. (°F)
1	0	1023	696.535	0.28	1.6	71	86	82	4	-	-	55
2	7	1030	696.4	0.29	1.7	71	86	82	4	-	-	55
3	14	1037	707.2	0.28	1.6	72	86	82	4	-	-	54
4	21	1044	706.3	0.30	1.8	72	86	82	5	-	-	53
5	28	1051	711.5	0.28	1.6	72	86	82	5	-	-	53
6	35	1058	716.3	0.28	1.6	72	88	83	5	-	-	53
7	42	1065	721.0	0.28	1.6	72	87	83	5	-	-	54
8	49	1072	726.3	0.29	1.7	72	87	83	5	-	-	53
9	56	1079	731.0	0.29	1.7	72	88	83	5	-	-	53
10	63	1086	736.3	0.29	1.6	72	88	83	5	-	-	54
11	70	1093	741.0	0.29	1.6	72	88	83	5	-	-	55
12	77	1100	746.3	0.27	1.6	72	88	83	5	-	-	55
	84	1107	751.018	0.28	1.6	72	89	84	5	-	-	55
1	0	1114	756.4	0.29	1.7	72	89	84	5	-	-	55
2	7	1121	761.1	0.29	1.7	72	89	84	5	-	-	55
3	14	1128	766.2	0.28	1.6	72	89	84	5	-	-	56
4	21	1135	771.3	0.28	1.6	73	90	85	5	-	-	56
5	28	1142	776.0	0.29	1.7	73	91	85	5	-	-	56
6	35	1149	780.7	0.30	1.8	73	91	86	5	-	-	57
7	42	1156	785.2	0.30	1.8	73	92	86	5	-	-	58
8	49	1163	789.8	0.30	1.8	73	93	87	5	-	-	57
9	56	1170	794.4	0.29	1.7	73	93	87	5	-	-	57
10	63	1177	799.0	0.29	1.7	72	93	88	5	-	-	57
11	70	1184	803.6	0.28	1.6	73	94	87	5	-	-	57
12	77	1191	808.2	0.28	1.6	74	94	87	5	-	-	57
	84	1198	812.510									
Ave / Sum			117.971	0.535	1.67	72.7	86.6					



5027 Irwindale Avenue, Suite 100
Irwindale, California 91706
Phone: 626-962-9375
Fax: 626-962-5905

Job Number: _____

Checked by: _____

Plant: CALIF. ELECTRO

Source: TANK 19 B

Date: 10-23-04

Operator: JR / DB

Filter #: —

Imp. Box #: SB

Method: RPA 306

Static Pressure: -0.2 "H₂O

Run #: 3 of 3

Barometric Pressure: 29.88 "Hg

Probe length / Type: 2' GLASS

Pitot tube ID: ST-18

Nozzle ID/diameter: 0.243

Meter/Pump Box #: 1A

Meter Delta H@: 1.844

Meter Gamma: 1.001

Impinger Pre Leak: 0.007 CFM @ 13 "Hg

Impinger Post Leak: 0.009 CFM @ 15 "Hg

Pitot Pre Leak: OK

Pitot Post Leak: OK

Traverse Point Number	Sampling Time (minutes)	Clock Time (24 hr clock)	Gas Meter Reading (cubic feet)	Velocity Head "H ₂ O	Delta H Actual "H ₂ O	Stack Temp (°F)	Dry Gas Meter Temp		Pump Vacuum (in. Hg)	Heated Probe (°F)	Heated Filter (°F)	Silica Gel Imp. (°F)
							Inlet (°F)	Outlet (°F)				
SE-1	0	1320	812.716	0.29	1.7	74	87	82	4	NA	NA	57
2	7	1327	817.6	0.28	1.6	74	87	82	4			54
3	14	1334	822.5	0.27	1.6	74	88	83	4			54
4	21	1341	827.4	0.27	1.6	75	89	83	4			54
5	28	1348	832.3	0.27	1.6	75	89	83	4			55
6	35	1355	837.2	0.28	1.6	75	89	83	4			54
7	42	1402	842.1	0.29	1.7	74	89	83	4			55
8	49	1409	847.0	0.29	1.7	74	90	84	4			55
9	56	1416	851.9	0.28	1.6	74	90	85	4			56
10	63	1423	856.8	0.30	1.8	75	91	85	4			56
11	70	1430	861.7	0.30	1.8	75	90	85	4			56
12	77	1437	866.6	0.29	1.7	74	91	85	4			56
SW-1	84	1444/46	871.536	0.28	1.6	75	92	86	4			56
2	91	1453	876.4	0.27	1.6	76	92	86	4			56
3	98	1500	881.3	0.27	1.6	76	93	87	4			57
4	105	1507	886.2	0.28	1.6	75	93	87	4			57
5	112	1514	891.1	0.28	1.6	75	94	88	4			56
6	119	1521	896.0	0.28	1.6	75	95	88	4			57
7	126	1528	900.9	0.29	1.7	76	96	89	5			57
8	133	1535	905.8	0.30	1.8	75	97	89	5			58
9	140	1542	910.7	0.30	1.8	75	97	90	5			57
10	147	1549	915.6	0.29	1.7	75	96	89	5			57
11	154	1556	920.8	0.28	1.6	75	96	89	4			58
12	161	1603	925.8	0.28	1.6	75	96	89	4			58
—	168	1610	930.801	—	—	END TEST	—	—	—	—	—	—

Ave / Sum			118.085	0.533	1.66	74.8	88.9					
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Professional Environmental Services, Inc.

PES

5207 Irwindale Ave. Suite 100
Irwindale, California 91706
Phone: 626-962-9375
Fax: 626-962-5905

SAMPLE RECOVERY SHEET

Job Number: _____

Checked by: _____

FACILITY: CALIF. ELEC.
SOURCE: TANF 19 B
DATE: 10/23/04
FILTER: N/A
RUN #: 3 of 3
METHOD #: EPA 306
BOX #: 5B

Observations: _____

IMPINGER	CONTENTS	FINAL GRAMS	INITIAL GRAMS	NET GRAMS
1	0.1N NaHCO ₃	658.0	655.8	2.2
2	0.1N NaHCO ₃	704.6	701.8	2.8
3	EMPTY	627.2	624.4	2.8
4	←	—	—	—
5	SILICA GEL	909.4	882.9	26.5

TOTAL GRAMS COLLECTED

34.3

SAMPLE FRACTIONS	CONTENTS	FINAL GRAMS	INITIAL GRAMS	NET GRAMS
1				
2				
3				
4				

INITIALS:

Prep/Recover

SB 1



Professional Environmental Services, Inc.

PES

5207 Irwindale Ave. Suite 100
Irwindale, California 91706
Phone: 626-962-9375
Fax: 626-962-5905

SAMPLE RECOVERY SHEET

Job Number: _____

Checked by: _____

FACILITY: CALIF ELEC
SOURCE: TANK 19B
DATE: 10-23-04
FILTER: —
RUN #: 1 of 3
METHOD #: EPA 306
BOX #: 9B

Observations: _____

IMPINGER	CONTENTS	FINAL GRAMS	INITIAL GRAMS	NET GRAMS
1	0.1N NaHCO ₃	715.9	712.5	3.4
2	0.1N NaHCO ₃	710.6	708.0	2.6
3	EMPTY	633.9	631.2	2.7
4	—	—	—	—
5	SILICA GEL	917.9	893.7	24.2

TOTAL GRAMS COLLECTED

32.9

SAMPLE FRACTIONS	CONTENTS	FINAL GRAMS	INITIAL GRAMS	NET GRAMS
1				
2				
3				
4				

INITIALS:

Prep/Recover

SD /

**PES**

Professional Environmental Services, Inc.

5207 Irwindale Ave. Suite 100
Irwindale, California 91706
Phone: 626-962-9375
Fax: 626-962-5905

SAMPLE RECOVERY SHEET

Job Number: _____

Checked by: _____

FACILITY: CALIF. ELEC.
SOURCE: TANK 19B
DATE: 10/23/01
FILTER: N/A
RUN #: 2 of 3
METHOD #: EPA 306
BOX #: 7B

Observations: _____

IMPINGER	CONTENTS	FINAL GRAMS	INITIAL GRAMS	NET GRAMS
1	0.1N NaHCO ₃	661.1	656.9	4.2
2	0.1N NaHCO ₃	720.0	716.5	3.5
3	EMPTY	620.3	618.1	2.2
4	—	—	—	—
5	SILICA GEL	926.0	900.7	25.3

TOTAL GRAMS COLLECTED	35.2
-----------------------	------

SAMPLE FRACTIONS	CONTENTS	FINAL GRAMS	INITIAL GRAMS	NET GRAMS
1				
2				
3				
4				

INITIALS: _____

Prep/Recover

SHB /

APPENDIX C
LABORATORY DATA



November 5, 2004

Professional Environmental Services
5027 Irwindale Ave
Suite 100
Irwindale, CA 91706

Attn: Dennis Becvar

Job No: 73864

SF

LABORATORY REPORT

Samples Received: Four (4) Samples
Date Received: 10/26/2004
Purchase Order No: 1111.001

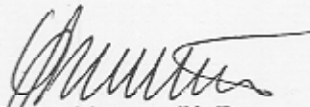
The samples were analyzed as follows:

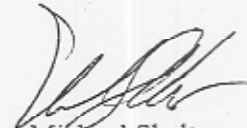
Analysis

Page

Hexavalent Chromium by CARB 425
Total Chromium by CARB 425

2
3


D.J. Northington, Ph.D.
Quality Assurance Officer


Michael Shelton
Senior Staff Chemist

WEST COAST ANALYTICAL SERVICE, INC.

Professional Environmental Services
Attn: Dennis Becvar

Job No: 73864
November 5, 2004

Hexavalent Chromium by CARB 425
Ion Chromatography with Post-Column Derivatization-Visible Absorption

<u>Sample ID</u>	<u>Result (µg/L)</u>	<u>Volume (L)</u>	<u>Total µg</u>
Run No. 1	0.75	0.335	0.25
Run No. 2	0.28	0.320	0.090
Run No. 3	0.23	0.355	0.082
Blank	ND	0.240	ND

Detection Limit: 0.01

Date Analyzed: 10-27-04

Calibration Summary

Sample ID: Laboratory Control Standard (5.00 ppb Second Source Standard)

<u>Date Analyzed</u>	<u>Result</u>	<u>% Rec</u>	<u>% Rec Limits</u>
10-27-04	4.96	99	90 - 110

Standard Curve

Levels: 7
Range: 0 - 20 ppb
Low Standard: 0.25 ppb
r²: 1.0000

Standard curve replicates run after samples all within 95-105%

Calibration Blank (0.05N Sodium Bicarbonate): ND (n=7)

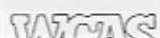
Quality Control Summary

Sample ID: Run No. 1

<u>Analyte</u>	<u>Sample Result</u>	<u>Duplicate Result</u>	<u>Average Result</u>	<u>Sample RPD</u>	<u>Spike Conc</u>	<u>Spike Result</u>	<u>Spike % Rec</u>
Hexavalent Chromium	0.75	0.67	0.71	11	2.00	2.67	98

QC Guidelines 12 67-117

This report is to be reproduced in its entirety.



WEST COAST ANALYTICAL SERVICE, INC.

Professional Environmental Services
Attn: Dennis Becvar

Job No: 73864
November 5, 2004

Total Chromium by CARB 425
Quantitative Analysis Report
GFAA SOP 7600 Rev. 2

<u>Sample ID</u>	<u>Chromium</u> <u>($\mu\text{g/L}$)</u>	<u>Volume</u> <u>(L)</u>	<u>Chromium</u> <u>(μg)</u>
Blank	ND	0.240	ND
Run No. 1	1.9	0.335	0.64
Run No. 2	1.3	0.320	0.42
Run No. 3	1.2	0.355	0.43

Detection Limit: 1

Date Analyzed: 11-02-04

Standard Curve, 5 points, (2 replicates), range 1-50 ppb, $r^2 = 0.99997$

Quality Control Summary

Sample: Run No. 1

<u>Analyte</u>	<u>Sample</u> <u>Result</u>	<u>Duplicate</u> <u>Result</u>	<u>Average</u> <u>Result</u>	<u>Sample</u> <u>RPD</u>	<u>Spike</u> <u>Conc.</u>	<u>Spike</u> <u>Result</u>	<u>Spike</u> <u>% Rec</u>
Chromium	1.9	1.8	1.85	NA	40.0	39.9	95

Control Limits: <20% 85-115

Sample: Laboratory Fortified Blank (LFB)

<u>Analyte</u>	<u>Blank</u> <u>Result</u>	<u>Spike</u> <u>Conc</u>	<u>Spike</u> <u>Result</u>	<u>Spike</u> <u>% Rec</u>	<u>% Rec</u> <u>Limit</u>
Chromium	ND	40.0	40.2	101	85-115%

Date Analyzed: 11-02-04

This report is to be reproduced in its entirety.

Chain-of-Custody



West Coast Analytical Service, Inc.
9240 Santa Fe Springs Rd
Santa Fe Springs, CA 90670
562.948.2225 fax 562.948.5850
w c a s . c o m

Mail Report to the following:

Company: Pro. Env. Svc. Inc.
Contact: Donnis Becvar
Address: 5029 Inland Ave
City/State/Zip: Wendota CA 91780
Phone: 562.948.3277 Fax: 562.948.5905

Project Information:

Project Manager: Donnis Becvar
Project Name: Cat Etc.
Purchase Order No.: 100
Purchasing Contact: Donnis Becvar
Purchasing Phone No.: 562-948-3277

Turn-around-time Hazards:

- ☒ Normal (7-10 work days)
☐ Rush 5 day } **Extra Charge**
☐ Rush 3 day
☐ Rush 1 day

Comments:

Sampler's Name(s):

Donnis Becvar / Joe Rubio

Sample Identification

Date Time

Run No. 1 10/23
Run No. 2 10/23
Run No. 3 10/23
Run No. 4 10/23

Preservation

of Containers

If there are multiple choices for an item please circle one.

Water: Drinking Ground Waste
Soil
Waste
Other

Check One

CCR Metals: TLCL STLC
RCRA Metals: Totals TCLP
Hexavalent Chromium: 218.6 7199
Total Chromium by ICPMS
Volatile Organics by GCMS
Semi-volatile Organics by GCMS
Organochlorine Pest/PCB
Hydrocarbons by 8015M
Hexane Ext by 1664: HEM SGT/HEM

Remarks

Matrix
0.1 M Nitric
Spike &
Duplicate
on Run 1
Analyze per
CARB 425
Samples
Collected by
EPA306

Relinquished by: <u>Donnis Becvar</u>	Company: <u>WCAS</u>	Date: <u>10/26</u>	Time: <u>11:37</u>	Received by: <u>Joe Rubio</u>	Company: <u>WCAS</u>
Relinquished by: <u>Joe Rubio</u>	Company: <u>WCAS</u>	Date: <u>10/26</u>	Time: <u>11:37</u>	Received by: <u>Donnis Becvar</u>	Company: <u>WCAS</u>
Relinquished by: <u>Joe Rubio</u>	Company: <u>WCAS</u>	Date: <u>10/26</u>	Time: <u>11:37</u>	Received by: <u>Donnis Becvar</u>	Company: <u>WCAS</u>

NOTES: Samples will be discarded 30 days after invoicing unless notified in writing or high hazard.
All services provided will adhere to the WCAS Terms & Conditions found on the back.

White Copy - WCAS • Yellow - Report • Pink - Client

WCAS Job No. 1073864

WESTERN ANALYTICAL LABORATORIES, INC.

13744 MONTE VISTA AVENUE - CHINO, CALIFORNIA 91710-5512 - PHONE (909) 627-3628 - FAX (909) 627-0491 - <http://www.wal.cc>

CUSTOMER: PES INC
ADDRESS: 5027 IRWINDALE AVE STE 100
IRWINDALE, CA 91706

P429

WAL NO: 4100542

ATTENTION: DENNIS BECVAR

DATE RECEIVED: 10/26/04

DATE OF REPORT: 10/28/04

SAMPLE ID: CHROME SOLUTION

DATE SAMPLED: 10/23/04

TANK NO:

1 GALLONS:

ANALYSIS

RESULTS

CHROMIC ACID

30.2 oz/gal

SURFACE TENSION

22.2 dynes/cm

pH

0.35

MR

FAX TO 626-962-5905


Gregory Conti, Assistant Laboratory Director

STATE CERTIFIED LABORATORY - INDUSTRIAL WASTE WATER - HAZARDOUS WASTE - DOMESTIC WATER
METAL FINISHING SOLUTION ANALYSIS AND PROCESS CONTROL

WESTERN ANALYTICAL LABORATORIES, INC.

13744 MONTE VISTA AVENUE - CHINO, CALIFORNIA 91710-5512 - PHONE (909) 627-3628 - FAX (909) 627-0491 - <http://www.wal.cc>

CUSTOMER: PES INC
ADDRESS: 5027 IRWINDALE AVE STE 100
IRWINDALE, CA 91706

P429

WAL NO: 4100543

DATE RECEIVED: 10/26/04

ATTENTION: DENNIS BECVAR

DATE OF REPORT: 10/28/04

SAMPLE ID: CHROME SOLUTION

DATE SAMPLED: 10/23/04

TANK NO:

2 GALLONS:

ANALYSIS

RESULTS

CHROMIC ACID

30.1 oz/gal

SURFACE TENSION

23.2 dynes/cm

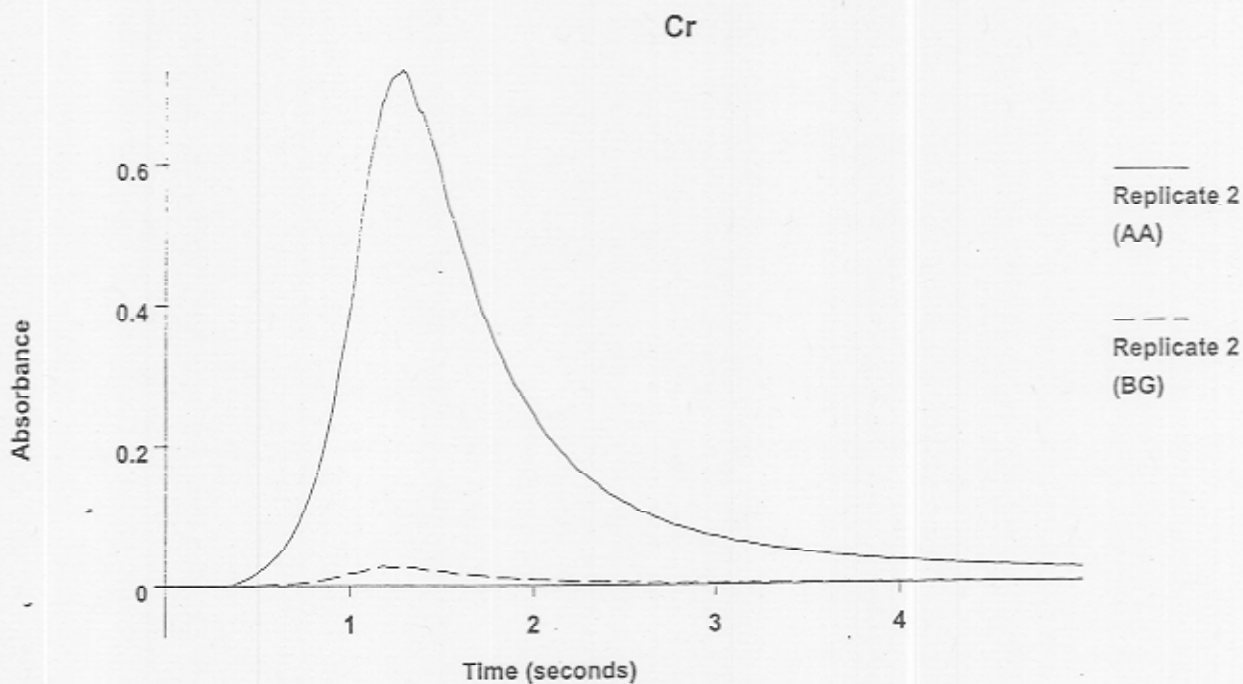
pH

0.34

MR
FAX TO 626-962-5905



Gregory Conti, Assistant Laboratory Director

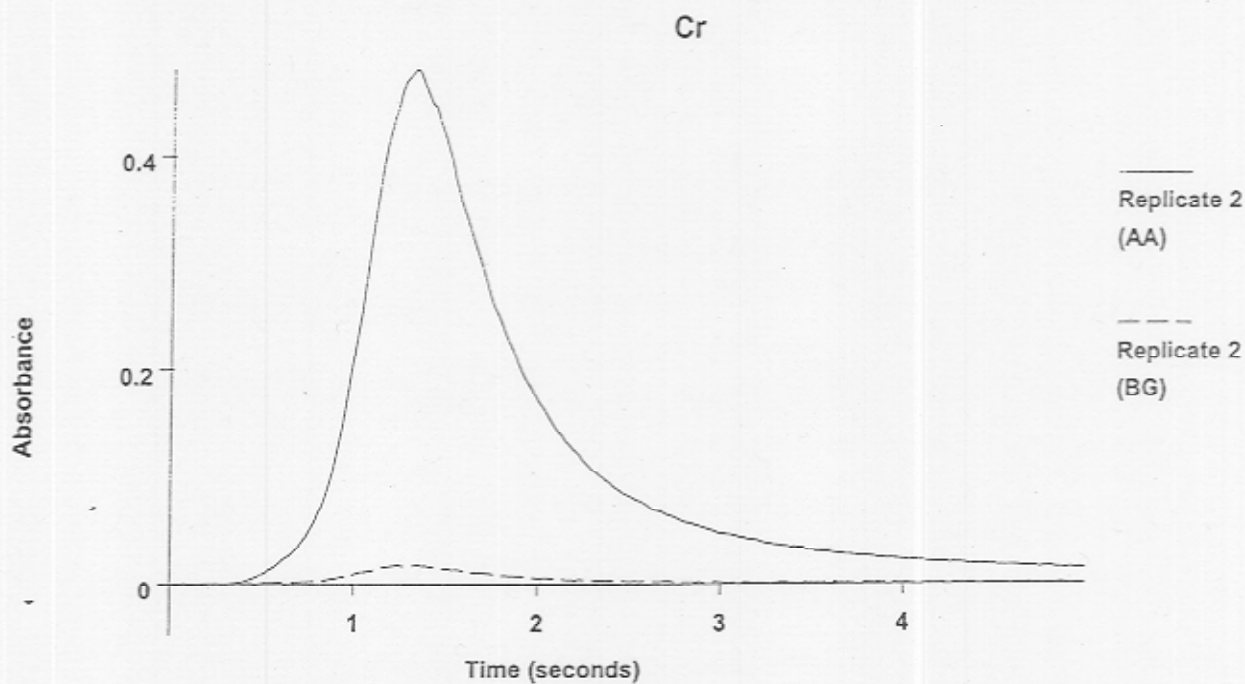


Mean: 40.2 40.2 0.7794
SD : 0.07 0.07 0.0013
%RSD: 0.2 0.2 0.1716

$$\frac{40.2}{40} \times 100 = 101\%$$

=====
Element: Cr Seq. No.: 19 AS Loc.: 18 Date: 11/02/2004
Sample ID: CB CRU-25 ppb
μL dispensed: 20 from 18 St 11/03/04

Repl #	SampleConc μg/L	StndConc μg/L	BlkCorr Signal	Peak Area	Peak Height	Bkgnd Area	Bkgnd Height	Time	Peak Stored
1	26.1	26.1	0.5064	0.5141	0.4752	0.0191	0.0185	03:37:06	No
2	26.3	26.3	0.5093	0.5170	0.4802	0.0194	0.0180	03:39:45	Yes



Mean:	26.2	26.2	0.5079
SD :	0.11	0.11	0.0020
%RSD:	0.4	0.4	0.4011

$$\frac{26.2}{25} \times 100 = 105\%$$

Element: Cr Seq. No.: 20 AS Loc.: 19 Date: 11/02/2004
Sample ID: ~~25 ppb Cr CCV~~ CB SH 11/03/04 C
µL dispensed: 20 from 19

Repl #	SampleConc µg/L	StdConc µg/L	BlkCorr Signal	Peak Area	Peak Height	Bkgnd Area	Bkgnd Height	Time	Peak Stored
1	0.5	0.5	0.0105	0.0181	0.0079	0.0008	0.0012	03:42:26	No
2	0.3	0.3	0.0063	0.0140	0.0061	0.0011	0.0010	03:45:07	Yes